PSY 493W
Neuroscience of Human and Animal Emotions
Spring, 2025

Description: This is an advanced seminar-style course in Behavioral Neuroscience, with an emphasis on how the nervous system controls the recognition and expression of emotions such as fear, anxiety, disgust, happiness, and love. This course deals with **a lot of the biology** underlying the regulation of emotions, so if you don't like general biology or neuroscience very much **this may not be the course for you**. Students should already have a background in physiological psychology and/or neurobiology (either PSY 209, IBIO 402 or 405, and/or NEU 301 or 302) and a good understanding of statistics and experimental design (PSY 295 or STT 201 or higher). This course also fulfills the University's Tier II writing requirement, so most assignments involve writing. In addition to obtaining a solid understanding of how the brain controls emotions, it is expected that students will leave the course with stronger writing abilities, confidence in their ability to express their thoughts about the course topics, and enhanced critical and scientific thinking skills.

***Where and When*:** Giltner Hall, room 101; Tuesdays and Thursdays, 3:00-4:20 pm

Instructor: : Prof. J. Lonstein
Office – 4017 ISTB
E-mail - lonstein@msu.edu
Office Hours - Tuesdays 1:00-2:00 pm by Zoom, or just email me to make an appointment

Required Book: The Feeling Brain: The Biology and Psychology of Emotions (2015) by E. Johnston & L. Olson (J&O). Used copies are OK and a less-expensive Kindle/Ebook version is also available online.

Grading*:* There are 200 points to obtain toward your grade this semester:

1) 15% of your grade will be based on you reading and commenting/reflecting on the assigned readings (20 points) and your frequency of participation in class discussions throughout the semester (10 points).

For every topic in the course, I'll provide some background information during lectures, and you'll read a small number of scientific articles assigned for each class. All articles for you to read are uploaded as PDFs into D2L. This syllabus also contains the citation information for every article assigned to be read, so you can also get the articles from the MSU library if you need to. To ensure that you read the assigned articles before coming to class, before you arrive to some of our classes you will write commentaries/reflections about one or more of the articles assigned for that day and submit it in the course's D2L Commentaries/Reflections folders before the start of that day's class meeting. Your critical commentaries/reflections should directly pertain to the content of the articles, and can be about something in each article you thought was particularly interesting, some specific aspects you would have liked the authors to have explained better, and how something you read in the article tied into something specific you learned in another course. Your writing on each article requiring commentary/reflection must be at least 1/3 of a typed page of single-spaced 12-point Times Roman font text with 1-inch page margins; that means each commentary/reflection must be about 13 lines of typed text.

This portion of your grade will be based on you handing in these commentary/reflection assignments, as well as whether the commentaries/reflections show that you read and thought about the articles before coming to class. I will grade each of the eight commentary/reflection assignments using a 2.5-point system: 0 = you didn't hand anything in, 1.0 = unsatisfactory (analysis and comments about the article were quickly done right before class), or 2.5 = satisfactory (you clearly spent some time reading and thinking about the article). You can hand in a set of commentaries/reflections late only if you have a documented medical, religious, legal, or grief excuse (grief request must be pre-submitted to MSU), or an MSU-sanctioned event excuse. In those cases the commentaries/reflections must be handed in within one week of the original due date. Personal/family travel, having to go to work, or lack of planning are not acceptable reasons to receive

an extension on submitting these commentaries/reflections or any other assignment in this course.

Everyone must read the articles before coming to class because on the eight class days when commentaries/reflections are due I will split the class into small groups to talk about each article. For 15 minutes, each group will discuss four things about one of the assigned articles: (1) what the experiments intended to investigate and what the authors' hypotheses were, (2) the methods used to perform the experiments, (3) what the major findings were, and (4) what the authors' major conclusions were. If your group still has time after covering these four details about the article, you can also share with each other what you wrote in your own commentaries/reflections. I will then randomly choose one member of each group to take ~10 minutes to verbally present the highlights of that article to the rest of the class. The whole class will then discuss the article. You will not know before class which article your group will discuss or present. All students will present in this informal manner at least once over the course of the semester.

You can receive points by participating in the larger group discussions on the eight class days when commentaries/reflections are due (8 times x 1.25 points each = 10 points). I keep track during class discussions if each student contributes something meaningful and relevant to the larger group discussions, and you will receive 1.25 points for each day's group discussion in which you do meaningfully contribute. If you meaningfully contribute even just once to the larger group discussion, you will receive the discussion points for that day. Becoming comfortable discussing the scientific material you read for class is a critical objective of this course. Therefore, even if you regularly show up to class, if you never participate in the larger group discussions you will receive a zero for this portion of your grade.

2) 30% of your course grade will come from the two exams (2 exams x 30 points each = 60 points) and 15% of your course grade from an end-of-semester quiz (30 points). You will take the two exams in class in person on your laptops, they will be closed-book, and in essay format. They will cover material presented through the class period before each particular exam (that is, they are not cumulative). The exams will cover material from both the lectures and the assigned readings (including readings we do not discuss on class discussion days). Some information you are responsible for on the exams will only be discussed in class, and will not be found in the required book or the readings, so you will have to come to class to get all the necessary information. I may give you the pool of possible essay questions in advance of an exam, and if I do that, you do not have permission to work together to create your answers to them before the exam (your answers must be generated independent of your classmates or any other people). After an exam is graded and returned to you, any questions about how your exam was graded must be sent to me by email within one week after I return your exam, after which you and I will email or meet within a week to discuss it. I will not discuss or reconsider exam grading any later than that. The end-of-semester quiz will be multiple choice questions about information presented in class from after Exam 2 until the day of the end-of-semester quiz.

A make-up exam or quiz will be granted only in the case of a documented medical, religious, legal, grief (request must be pre-submitted to MSU), or MSU-sanctioned event excuse. A make-up exam or quiz must be completed within 7 days of the original exam or quiz date. It may or may not be the same exam or quiz that was taken by the other students in the class. Personal/family travel, having to go to work, or lack of planning are not acceptable reasons to receive a make-up exam or quiz.

3) 40% of your grade (80 points) will be from preparing and handing in an annotated bibliography, which I will discuss in detail in class. Your annotated bibliography will be on a **minimum of 15** published primary scientific research articles containing experiments conducted on a small subfield of your choice on the biological factors (genes, brain sites or systems, neurochemicals) underlying one of the emotions covered in class. Your annotated bibliography must be at least 8 full, double-spaced typed pages of meaningful text. These at least 8 pages does not include the required title page (do not put the title or your name on your first page of the main text) and does not include the reference list at the end. If your annotated bibliography has fewer than 8 pages of meaningful and relevant main text, each page short will involve a 10% loss of your grade on this assignment. You must use 12-point Times Roman font and 1-inch margins around. Do not include a running header at the top of the pages or use subheadings within the text. Do not include any additional spaces between paragraphs. Please do put page numbers on the bottom of each page. A list of references used in the paper must be included at the end of the main text of the annotated

bibliography and follow the American Psychological Association (APA) formatting style for references. Footnotes for references are not acceptable. The paper cannot use more than ½ page as a general introduction to your topic and cannot use more than ½ page for summary or conclusion paragraph at the end.

To obtain the necessary information for your annotated bibliography you should exclusively use scientific primary research articles similar to the ones we read in class. Textbooks, articles from popular magazines, health-related websites, and class lecture notes are not appropriate sources for this annotated bibliography and I will ask you to remove them. The two essential places to find abstracts of the scientific primary research articles you should use for your bibliography are: PubMed (https://pubmed.ncbi.nlm.nih.gov/) and Google Scholar (https://scholar.google.com/). When on these websites, type in the keywords most relevant for your topic. Once you find the abstracts of the article you're interested in, you can either download the full articles from the links provided on the database webpages, or if those links are not available you can make a request through the Main Library's webpage to send you a PDF of the article through Interlibrary Loan. Again, sources found outside these two databases probably aren't appropriate for this paper.

To receive full credit for the annotated bibliography assignment, you must turn in on the assigned dates specified below: (1) A 1-page double-spaced description of the topic you would like to read and write about and a brief discussion of why you think it's an important/interesting topic. I'll then email with you to discuss and help you refine your topic. (2) An organized list containing 8 of the at least 15 primary research articles you intend to eventually include in your annotated bibliography. I'll look at your list, email you to discuss it, and may ask you to change some of the articles it contains. (3) An MS Word file containing your final annotated bibliography submitted on D2L. Throughout the semester, we'll take class time to talk about the purpose, style, and structure of an annotated bibliography. I'll also be happy to once read up to three pages of draft of your annotated bibliography to let you know if you're on the right track, as long as I receive it at least three days before the final version of the paper is due. **You cannot pass the course without satisfactorily completing all components of this annotated bibliography (one-page topic proposal, partial list of sources, completed annotated bibliography)**, even if you could have enough points to pass the course without handing in some parts of this annotated bibliography assignment. You are also required to submit the final draft of your annotated bibliography to analysis by Turn-It-In on our D2L site under the "Assignments" tab, to verify that the content is original (see below for details).

Grading Summary and Scale:

Commentaries/Reflections =	20 points (2.5 points each)
Class Discussion =	10 points (1.25 points each time you participate)
Exams =	60 points (30 points each)
End of Semester Quiz =	30 points
Annotated Bibliography =	80 points (topic proposal = 5 pts, organized list of 8 articles = 15 pts, final annotated bibliography = 50 pts)
TOTAL =	**200 points**

>180 points = 4.0
170-179 points = 3.5
160-169 points = 3.0
150-159 points = 2.5
140-149 points = 2.0
130-139 points = 1.5
120-129 points = 1.0
<120 points = 0.0

Academic Honesty and Integrity:

MSU has strict guidelines regarding academic honesty and integrity. These rules will be followed in this class, and no student is exempt for any reason. The Spartan Code of Honor states, "As a Spartan, I will strive to uphold values of the highest ethical standard. I will practice honesty in my work, foster honesty in my peers, and take pride in knowing that honor is worth more than grades. I will carry these values beyond my time as a student at Michigan State University, continuing the endeavor to build personal integrity in all that I do." In addition, Article 2.III.B.2 of the Student Rights and Responsibilities (SRR) states that "The student shares with the faculty the responsibility for maintaining the integrity of scholarship, grades, and professional standards." The Psychology Department adheres to the policies on academic honesty as specified in General Student Regulations 1.0, Protection of Scholarship and Grades; the all-University Policy on Integrity of Scholarship and Grades; and Ordinance 17.00, Examinations. Therefore, unless authorized by Professor Lonstein, you are expected to complete all course assignments including homework, lab work, quizzes, tests, exams, papers without assistance from any source (including any of your classmates or any other person). You are expected to develop original work for this course; therefore, you may not submit course work you completed for another course to satisfy the requirements for this course. Also, you are not authorized to use online course repositories to complete any assignment in this course. Students who violate MSU academic integrity rules may receive a penalty grade, including a failing grade on the assignment or in the course. The University has some very specific information about the kinds of activities that are or are not appropriate and also please do not hesitate to discuss concerns or questions about these issues with Professor Lonstein.

Furthermore, consistent with MSU's efforts to enhance student learning, foster honesty, and maintain integrity in our academic processes, the course instructors will use a tool called Turnitin to compare a student's work with multiple sources. All submissions to this course may be checked using the TurnItIn tool. TurnItIn compares each student's work with an extensive database of prior publications and papers, providing links to possible matches and a 'similarity score'. The tool does not determine whether plagiarism has occurred or not. Instead, the instructor must make a complete assessment and judge the originality of the student's work. Furthermore, Professor Lonstein strives to create an academic environment where learning is the foremost priority. Thus, he strongly believes that learning is best achieved through the hard work and dedication required for novel, independent thinking and writing. As such, the use of generative AI tools (such as ChatGPT, DALL-E, etc.) is not permitted in this class. Any use of AI tools for work in this class may be considered a violation of Michigan State University's policy on academic integrity, the Spartan Code of Honor Academic Pledge and Student Rights and Responsibilities, since the work is not your own. The use of unauthorized AI tools will result in a zero grade on the AI-generated or -assisted assignment and a possible failing grade in the course.

Limits to Confidentiality:

Assignment materials submitted for this class are generally considered confidential pursuant to the University's student record policies. However, students should be aware that University employees, including instructors, may not be able to maintain confidentiality when it conflicts with their responsibility to report certain issues to protect the health and safety of MSU community members and others. As the instructor, Professors Lonstein and Levendosky must report the following information to other University offices (including the MSU Police Department) if you share it with either of them:

- Suspected child abuse/neglect, even if this maltreatment happened when you were a child,
- Allegations of sexual assault or sexual harassment when they involve MSU students, faculty, or staff, and
- Credible threats of harm to oneself or to others

These reports may trigger contact from a campus official who will want to talk with you about the incident that you have shared. In almost all cases, it will be your decision whether you wish to speak with that individual. If you would like to talk about these events in a more confidential setting you are encouraged to make an appointment with the MSU Counseling Center.

***Accommodations for Students with Disabilities*:**
Michigan State University is committed to providing equal opportunity for participation in all programs, services and activities. Requests for accommodations by persons with disabilities may be made by contacting the Resource Center for Persons with Disabilities at 517-884-RCPD or on the web at rcpd.msu.edu. Once your eligibility for accommodation has been determined, you will be issued a Verified Individual Services Accommodation ("VISA") form. Please present this form to me at the start of the term and/or two weeks prior to the accommodation date (test, project, etc.). Requests received after this date may not be honored. If you require testing accommodation (e.g., additional time), you must contact Professor Lonstein and present your VISA to him ***at least two weeks before the exam date*** to schedule an alternative exam.

Disruptive Behavior:
Article 2.III.B.4 of the Student Rights and Responsibilities (SRR) for students at Michigan State University states: "The student's behavior in the classroom shall be conducive to the teaching and learning process for all concerned." Article 2.III.B.10 of the SRR states that "The student and the faculty share the responsibility for maintaining professional relationships based on mutual trust and civility." General Student Regulation 5.02 states: "No student shall . . . interfere with the functions and services of the University (for example, but not limited to, classes . . .) such that the function or service is obstructed or disrupted. Students whose conduct adversely affects the learning environment in this classroom may be subject to disciplinary action."

Inclusive Environment:
MSU is committed to creating and maintaining an inclusive community in which students, faculty, and staff can work together in an atmosphere free from all forms of discrimination. The Office of Institutional Equity (OIE) reviews concerns related to discrimination and harassment based on sex, gender, gender identity, race, national origin, religion, disability status, and any other protected categories under the University Anti-Discrimination Policy (https://www.hr.msu.edu/policies-procedures/university-wide/ADP_policy.html) and Policy on Relationship Violence and Sexual Misconduct (https://civilrights.msu.edu/policies/rvsm.html). If you experience or witness acts of bias, discrimination, or harassment, please report these to OIE: http://oie.msu.edu/.

Date	Topics and Readings
Tues Jan 14	**Introduction to the Study of Emotions** • J & O Introduction
Thurs Jan 16	**Defining Emotions I** • J & O Chapter 1 • James, W. (1884) What is an emotion? *Mind*, v. 9, 188-205.
Tues Jan 21	**Defining Emotions II** • Cannon, W.B. (1927). The James-Lange theory of emotions: Critical examination and an alternative theory. *American Journal of Psychology,* 39, 106–124. • Ali, N., Nitschke, J.P., Cooperman, C. & Pruessner, J.C. (2017). Suppressing the endocrine and autonomic stress systems does not impact the emotional stress experience after psychosocial stress. *Psychoneuroendocrinology*, *78*, 125-130.
Thurs Jan 23	**Basic Emotional Systems I** • J & O Chapter 3 • Darwin, C. (1872) - *Expression of Emotions in Man and Animals* (Chapters 5 and 7). • Shariff, A. F., & Tracy, J. L. (2011). What are emotion expressions for? *Current Directions in Psychological Science*, 20, 395-399.
Tues Jan 28	**Basic Emotional Systems II** • Ekman, P., Sorenson, E. R., & Friesen, W. V. (1969). Pan-cultural elements in facial displays of emotion. *Science*, 164, 86-88. • Ekman, P. & Cordaro, D. (2011). What is meant by calling emotions basic? *Emotion Review*, 3, 364-370. ✓ Written commentary/reflection #1 due on <u>both</u> of today's articles listed above
Thurs Jan 30	**Basic Emotional Systems III** • Barrett, L. F. (2006). Are emotions natural kinds? *Perspectives on Psychological Science*, 1, 28-58. ✓ Written commentary/reflection #2 due on today's article listed above
Tues Feb 4	**Overview of Limbic System Anatomy** • Kötter, R., & Stephan, K. E. (1997). Useless or helpful? The "limbic system" concept. *Reviews in the Neurosciences*, 8, 139-145.
Thurs Feb 6	**Limbic System Anatomy & Concepts I** • J & O Chapter 2 • MacLean, P.D. (1964). Man and his animal brains. *Modern Medicine* Feb. 3, 95–106.
Tues Feb 11	**Limbic System Anatomy & Concepts II** • Feinstein, J. S., Adolphs, R., et al. (2011). The human amygdala and the induction and experience of fear. *Current Biology*, 21, 34-8.

- Adolphs, R., Gosselin, F., et al. (2005). A mechanism for impaired fear recognition after amygdala damage. *Nature*, 433, 68-72
- Dalgleish, T. (2004). The emotional brain. *Nature Reviews Neuroscience*, *5,* 583-589.

✓ Written commentaries/reflections #3 due only on the Feinstein et al. (2011) and Adolph et al. (2005) articles listed above

Thurs Feb 13 **NO CLASS (Remembrance Day)**

Tues Feb 18 **EXAM 1 (Taken in class)**

Thurs Feb 20 **What Does (and What Doesn't) Functional MRI Tell Us?**

- Glover, G.H. (2011). Overview of functional magnetic resonance imaging. *Neurosurgery Clinics, 22,* 133-139.
- Bennett, CM, Baird A.A., Miller, M.B. & Wolford, LG (2010). Neural correlates of interspecies perspective taking in the post-mortem Atlantic salmon: An argument for proper multiple comparisons correction. *Journal of Serendipitous and Unexpected Results*, 1, 1-5.

Tues Feb 25 **Neural Basis of Fear 1**

- J & O Chapter 4
- LeDoux, J. E., Iwata, J., Cicchetti, P. R. D. J., & Reis, D. J. (1988). Different projections of the central amygdaloid nucleus mediate autonomic and behavioral correlates of conditioned fear. *Journal of Neuroscience*, 8, 2517-2529.
- LeDoux, J.E., Cicchetti, P., Xagoraris, A. & Romanski, L.M. (1990). The lateral amygdaloid nucleus: sensory interface of the amygdala in fear conditioning. *Journal of Neuroscience*, 10, 1062-1069.

Thurs Feb 27 **Neural Basis of Fear II**

- LaBar, K. S., Gatenby, J. C., Gore, J. C., LeDoux, J. E., & Phelps, E. A. (1998). Human amygdala activation during conditioned fear acquisition and extinction: a mixed-trial fMRI study. *Neuron*, 20, 937-945.
- Icenhour, A., Kattoor, J., Benson, S., Boekstegers, A., et al. (2015). Neural circuitry underlying effects of context on human pain-related fear extinction in a renewal paradigm. *Human Brain Mapping*, 36, 3179-3193.
- Lebrón, K., Milad, M.R. & Quirk, G.J. (2004). Delayed recall of fear extinction in rats with lesions of ventral medial prefrontal cortex. *Learning & Memory*, 11, 544-548.

✓ Written commentaries/reflections #4 due on all three of today's articles listed above

Tues/Thurs Mar 4, 6 **NO CLASS (Spring Break)**

Tues Mar 11 **Neural Basis of Anxiety I**

- Walker, D. L., & Davis, M. (1997). Double dissociation between the involvement of the bed nucleus of the stria terminalis and the central

nucleus of the amygdala in startle increases produced by conditioned versus unconditioned fear. *Journal of Neuroscience*, 17, 9375-9383.

- Yassa, M. A., Hazlett, R. L., Stark, C. E., & Hoehn-Saric, R. (2012). Functional MRI of the amygdala and bed nucleus of the stria terminalis during conditions of uncertainty in generalized anxiety disorder. *Journal of Psychiatric Research*, 46, 1045-1052.

Thurs Mar 13 **Neural Basis of Anxiety II**

- Schweimer, J., Fendt, M. & Schnitzler, H.U. (2005). Effects of clonidine injections into the bed nucleus of the stria terminalis on fear & anxiety behavior in rats. *European Journal of Pharmacology*, 507, 117-124.
- Klumpers, F., Kroes, M.C., Heitland, I., Everaerd, D., et al. (2015). Dorsomedial prefrontal cortex mediates the impact of serotonin transporter linked polymorphic region genotype on anticipatory threat reactions. *Biological Psychiatry*, 78, 582-589.
- Ventura-Silva, A.P., Borges, S., Sousa, N., Rodrigues, A.J. & Pêgo, J.M. (2020). Amygdalar corticotropin-releasing factor mediates stress-induced anxiety. *Brain Research*, *1729*, 146622-9.

✓ Written commentaries/reflections #5 due on <u>all three</u> of today's articles listed above

---

Tues Mar 18* **Neural Basis of Disgust I**

- Phillips, M. L., Young, A. W., Senior, C.,... & Gray, J. A. (1997). A specific neural substrate for perceiving facial expressions of disgust. *Nature*, 389, 495-498.
- Jabbi, M., Bastiaansen, J. & Keysers, C. (2008). A common anterior insula representation of disgust observation, experience and imagination shows divergent functional connectivity pathways. *PloS One*, 3, e2939.

✓ One-page annotated bibliography <u>topic proposal</u> due by the beginning of class

Thurs Mar 20 **Neural Basis of Disgust II**

- Shabel, S.J., Schairer, W., Donahue, R.J., Powell, V. & Janak, P.H. (2011). Similar neural activity during fear and disgust in the rat basolateral amygdala. *PloS One*, 6, e27797.
- Oaten, M., Stevenson, R.J., Williams, M.A., Rich, A.N., Butko, M. and Case, T.I. (2018). Moral violations and the experience of disgust and anger. *Frontiers in Behavioral Neuroscience*, 12, 179.
- Calder, A. J., Beaver, J. D., Davis, M. H., Van Ditzhuijzen, J., Keane, J., & Lawrence, A. D. (2007). Disgust sensitivity predicts the insula and pallidal response to pictures of disgusting foods. *European Journal of Neuroscience*, 25, 3422-3428.

✓ Written commentaries/reflections #6 due on <u>all three</u> of today's articles listed above

---

Tues Mar 25 **NO CLASS**

Thurs Mar 27	**EXAM 2 (Taken in class)**
Tues Apr 1	**How do you measure happiness in non-human animals?** • J & O Chapter 6 • Olds, J., & Milner, P. (1954). Positive reinforcement produced by electrical stimulation of septal area and other regions of rat brain. *Journal of Comparative and Physiological Psychology*, 47, 419.
Thurs Apr 3	**Neural Basis of Reward & Pleasure I** • Kringelbach, M. L., & Berridge, K. C. (2009). Towards a functional neuroanatomy of pleasure and happiness. *Trends in Cognitive Sciences*, 13, 479-487. • Burgdorf, J. & Panksepp, J. (2006). The neurobiology of positive emotions. *Neuroscience & Biobehavioral Reviews*, 30, 173-187.
Tues Apr 8	**Neural Basis of Reward & Pleasure II** • Knutson, B., Fong, G. W., Adams, C. M., Varner, J. L., & Hommer, D. (2001). Dissociation of reward anticipation and outcome with event-related fMRI. *Neuroreport*, 12, 3683-3687. • McCabe, C., Cowen, P. J., & Harmer, C. J. (2009). Neural representation of reward in recovered depressed patients. *Psychopharmacology*, 205, 667-677. • Wyvell, C.L. & Berridge, K.C. (2000). Intra-accumbens amphetamine increases the conditioned incentive salience of sucrose reward: enhancement of reward "wanting" without enhanced "liking" or response reinforcement. *Journal of Neuroscience,* 20*,* 8122-8130. ✓ Written commentaries/reflections #7 due on <u>all three</u> of today's articles listed above
Thurs Apr 10*	**Neural Basis of Parental Love I** • Numan, M. (1974). Medial preoptic area and maternal behavior in the female rat. *Journal Comparative & Physiological Psychology*, 87, 746. • Stolzenberg, D.S., Zhang, K.Y., Luskin, K., Ranker, L., Bress, J. and Numan, M. (2010). Dopamine D1 receptor activation of adenylyl cyclase, not phospholipase C, in the nucleus accumbens promotes maternal behavior onset in rats. *Hormones and Behavior*, 57, 96-104. ✓ Annotated bibliography organized list of 8 articles (titles and links to them) you intend to use is due by the beginning of class
Tues Apr 15	**Neural Basis of Parental Love II** • Strathearn, L., Li, J., Fonagy, P., & Montague, P. R. (2008). What's in a smile? Maternal brain responses to infant facial cues. *Pediatrics*, 122, 40-51. • Chase, H.W., Moses-Kolko, E.L., Zevallos, C., Wisner, K.L. and Phillips, M.L. (2014). Disrupted posterior cingulate–amygdala connectivity in postpartum depressed women as measured with resting BOLD fMRI. *Social Cognitive and Affective Neuroscience*, 9, 1069-1075.

- Mascaro, J.S., Hackett, P.D. & Rilling, J.K. (2014). Differential neural responses to child and sexual stimuli in human fathers and non-fathers and their hormonal correlates. *Psychoneuroendocrinology*, 46, 153-163.

✓ Written commentaries/reflections #8 due on <u>all three</u> of today's articles listed above

Thurs Apr 17 **Neural Basis of Romantic Love**

- Young, K.A., Liu, Y., Gobrogge, K.L., Wang, H. and Wang, Z. (2014). Oxytocin reverses amphetamine-induced deficits in social bonding: evidence for an interaction with nucleus accumbens dopamine. *Journal of Neuroscience*, 34, 8499-8506.
- Xu, X., Aron, A., Brown, L., Cao, G., Feng, T. and Weng, X. (2011). Reward and motivation systems: A brain mapping study of early-stage intense romantic love in Chinese participants. *Human Brain Mapping*, 32, 249-257.
- Rafi, H., Bogacz, F., Sander, D. and Klimecki, O. (2020). Impact of couple conflict and mediation on how romantic partners are seen: An fMRI study. *Cortex*, 130, 302-317.

Tues Apr 22 **END-OF-SEMESTER QUIZ (Taken in class)**

Thurs Apr 24 **Catch-up and Wrap-up**

- Lindquist, K.A., Wager, T.D., Kober, H., Bliss-Moreau, E. and Barrett, L.F. (2012). The brain basis of emotion: a meta-analytic review. *Behavioral and Brain Sciences*, 35, 121-143.

✓ Extra credit written commentary/reflection due on today's article listed above (optional)

Tues Apr 29 **FINAL ANNOTATED BIBLIOGRAPHIES DUE 10:00 am**

<u>*Important Dates to Remember about the annotated bibliography</u>:
Tues Mar 18 – Annotated bibliography one-page topic proposal due by beginning of class
Thurs Apr 10 - Organized partial list of 8 articles for your annotated bibliography due by beginning of class
Tues Apr 29 - This is Tuesday of finals week. The final version of your annotated bibliography is due <u>in our D2L dropbox by **10:00 am**</u> on this day.